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HOW THE FARMER CAN SAVE HIS SWEET POTATOES

And Ways of Preparing Them for the Table

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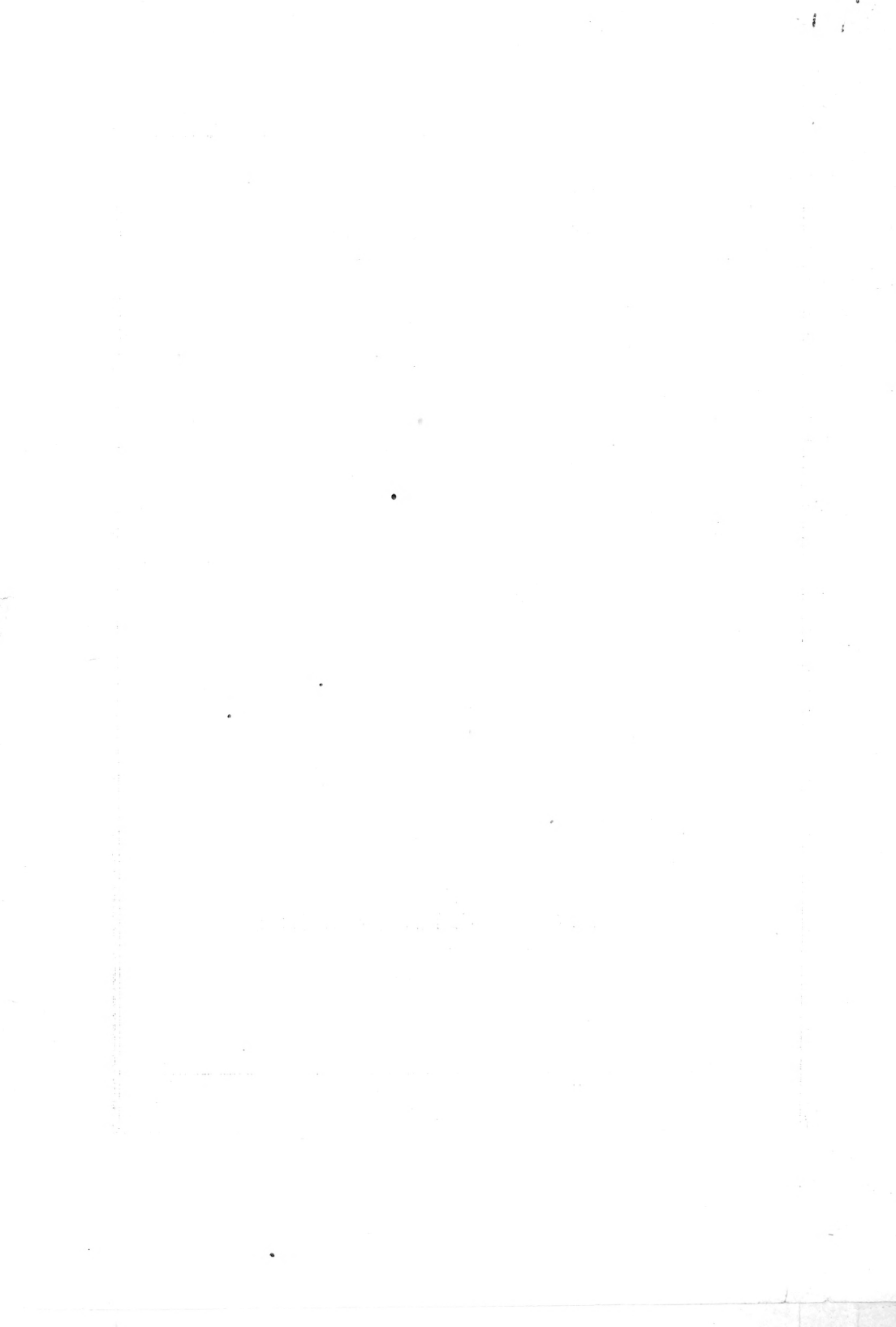


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How the Farmer Can Save His Sweet Potatoes And Ways of Preparing Them for the Table

By George W. Carver, M. S. Agr., D. Sc.

There are but few if any of our staple farm crops receiving more attention than the sweet potato, and indeed rightfully so—The splendid service it rendered during the great World War in the saving of wheat flour, will not soon be forgotten. The 118 different and attractive products (to date) made from it, are sufficient to convince the most skeptical that we are just beginning to discover the real value and marvelous possibilities of this splendid vegetable.

Here in the South, there are but few if any farm crops that can be depended upon one year with another for satisfactory yields, as is true of the sweet potato. It is also true that most of our Southern soils produce potatoes superior in quality, attractive in appearance and satisfactory in yield, as any other section of the country.

HISTORY

It is said that the early navigators of the sixteenth century recognized such a strong resemblance between the Irish potato and the sweet potato that they called them both by the same name.

They are not only botanically different but the edible parts of each are in character and taste quite unlike. Botanically, the sweet potato belongs to the morning glory family (Convolvulaceae), and has been given the technical name of *Impomoeabatatas*.

ORIGIN

The origin of the sweet potato is doubtful, although there is very strong evidence that it is distinctly American, as fifteen or sixteen known species of the genus *Batatas* are found in this country. The "Indian potato," "Tuckahoe" and "Hog potato," which grow abundantly in this country and throughout the South, are all species of this genus.

VARIETIES

More than 11 so-called varieties make up the present list, in many of which there is a distinction without a well-defined difference. Since some varieties do well in one section and practically fail in others. I have thought it wise to list none except those that have proven the most prolific and best with us.

Table Varieties—Dooley Yam, Improved Dooley Yam, Triumph, Pumpkin Yam, Porto Rico and Nancy Hall.

Varieties for Feeding Stock—These grow to a very large size and make a fine yield, but are not very sweet and rather inferior for table use, but for making flour, starch, tapioca and many other of the sweet potato products, they are excellent and in some instances, preferable—White Bermuda, Red Nansemond, "Negro Choker" and Hayti Spanish.

CLIMATE AND SOIL

As to climate, the sweet potato thrives and does its best only in a warm climate, with plenty of sunshine and moderate showers evenly distributed throughout the growing season. The growing popularity of the sweet potato, however, has caused greater adaptation of standard sorts to both soil and climate and the origin of many new varieties which to a remarkable degree adjust themselves to shorter growing seasons and colder soils, thus extending production much farther north, east and west. However, as far as possible, avoid planting in heavy, waxy soils as they are not conducive to heavy yields of potatoes.

SELECTING THE SEED

Experiments seem to indicate that very large potatoes are not preferable for seed, but those measuring from an inch to an inch and a half in diameter; they should be smooth, long or round as the variety suggests, and free from any woody or stringy appearance. Also select seed from those hills that show the largest percentage of marketable potatoes, the best flavor, the richest color and the largest yield.

THE PLANT BED

Select as warm and sunny a place as possible; further protect by banking upon the north side with earth. Build an ordinary plank cold frame from 5 to 6 feet wide and any length desired, facing and sloping towards the South, having its south wall several inches lower than its north wall. Bank up well on the outside and protect from water by running a little ditch around on the outside. Remove the earth within the frame to a depth of from 4 to 12 inches; spread a thin layer of oak leaves or pine straw on the bottom of this excavation. Upon this place a layer of manure, from 4 to 6 inches thick, and pound down slightly. Place a layer of soil over this from 2 to 3 inches thick. On this lay the sweet potatoes, side by side, horizontally and just far enough away to keep them from touching each other. Cover with good rich garden soil to a depth of 2 or 3 inches; cover with sash or canvas oiled with linseed or cotton seed oil.

The amount of manure required in the hot bed is governed solely by the climate, more being needed in cold than in warm climates. In the Gulf States, from 2 to 5 inches is the truck gardener's rule, while 10" to 12 inches is not uncommon in Iowa, Kansas and New Jersey. Keep the bed moist at all times. It requires from 5 to 6 weeks to produce slips large enough for setting.

The sweet potato plant is very susceptible to frost and should not be planted in large acreages earlier than April 15th in this section. When the plants are 3 to 5 inches in length and properly hardened off, they are ready to set. Ninety days after transplanting is an old rule, but we have been able to get potatoes as large as goose eggs, from the earliest varieties in 70 days.

NEW METHODS

In this method pure sand is used instead of soil, anyone who learns to use this method will never go back to the old. The chief advantages of this method are:

- 1st The slips are freer from disease.
- 2nd The slips seem to grow faster in the bed.
- 3rd Fewer potatoes rot in the bed.
- 4th The slips live not only just as well when set out, but I believe, grow off better and faster than when growing in the soil.
- 5th The slips develop very strong roots.

VINE CUTTING

It is generally conceded that after the vines have begun to run well, the cuttings are far more preferable than the slips. Several stations have devoted considerable time to this important problem and found that under favorable conditions there is practically no difference in the yield. They did, however, find that a close pruning of the vines decreased the amount of marketable potatoes by increasing the number of small ones.

This station verified the above from 1908 to 1919, testing out many varieties, each variety attesting to the truth of the above statement.

PREPARATION OF LAND

In this country the land should be broadcasted to a depth of 9 or 10 inches. If barnyard manure, mulch, leaves, etc., are to be used as a fertilizer, it should be broadcasted and ploughed in. Harrow repeatedly until the soil is thoroughly pulverized and mixed. If rich, coarse, strawy fertilizers are used, without mixing well, the potatoes almost invariably will be black, scurfy and unattractive in appearance, with poor keeping qualities.

PLANTING

In setting the plants it is very essential that the ridges be cleaned of weeds—never set plants on a weedy ridge, as it multiplies the work, increases the expense of the crop and often reduces the yield of potatoes by stunning the growth of the plant.

In planting set the slips a little deeper than they were in the plant bed. Just after a moderate shower is the most favorable time for setting, although this can be successfully done in very hot dry weather as follows: (a) By watering the plants, which is tedious and impracticable, as a rule, where large acreages are to be planted. (b) By puddling or mudding the roots, which consists of making a loblolly of thin clay mortar and dipping the roots into it—balls of this moist clay will stick to the roots and stem and, if planted at once, will tide the plant over 9 or 10 days of protracted drought.

FERTILIZING

A series of experiments demonstrated that the gray sandy soils of Macon County respond best to a mixture of 600 pounds of muriate of potash, 120 pounds of acid phosphate and 75 pounds of nitrate of soda per acre, making a total of 795 pounds. The application was made exactly the same as for planting cotton except that only half of the mixture was applied before the plants were set; the other when the plants began to run vigorously. A Ghant fertilizer distributor was used to put the fertilizer down each time. The second application of the fertilizers gave the best results, as our soils are leachy, and much of it would have been washed away and probably an equal amount sunken below the depth to which the roots could reach, if all had been put in at one time.

COMPOST FERTILIZERS

HOW TO MAKE THE COMPOST

Two loads of leaves and muck (muck is simply the rich earth from the swamp) are taken, and spread out in a pen. One load of barnyard manure is spread over this. The pen is filled in this way. It is either rounded over like a potato-hill, or a rough shed is put over it to turn the excess of water, so as to prevent the fertilizing constituents from washing out. It is allowed to stand this way until spring.

WHEN TO MAKE COMPOST

Begin your compost heap now; do not delay; let every spare moment be put in the woods raking up leaves or in the swamps piling up muck. Haul and put in these pens. Do not wait to get the barnyard manure—you can mix in it afterwards, or if you cannot get the barnyard manure at all, the leaves and muck will pay you many times in the increased yield of crops.

HOW TO USE

Prepare the land deep and thorough. Throw out rows with a middle-burster or two-horse plow; put in the compost at the rate of 20 tons per acre, 25 where the land is very poor. Save all the wood ashes, waste lime, etc., and mix into this compost.

RESULTS

Three acres of our experimental farm has had no commercial fertilizer put upon it for 15 years. The land has been continually cropped, but has increased in fertility every year, both physically and chemically, on no other fertilizer than muck compost and the proper rotation of crops. This year 215 bushels of sweet potatoes were made per acre, with no other fertilizer than the above compost.

INSECT ENEMIES

In this section there are practically no insects that give the farmer trouble—neither cut worms, flea beetles nor the tortoise beetles. The constant stirring of the ground and the vigorous growth are all against injurious attacks of insects.

FUNGUS DISEASES

In this section there are two or three diseases that are especially troublesome, viz., black rot (*Ceratocystis fimbriata*). This disease is especially destructive in the storeroom. With us, all varieties seem to be equally affected. The tubers are more or less marked (according to the severity of the disease) with dark brown patches, which give the whole tuber an unpleasant bitter taste. If only slightly affected, they bear strong resemblance, in taste, to frosted potatoes, and for this reason many mistakes are made. It often attacks the plants in the bed, and may be recognized by the plants turning black at the bottom and of course such will soon die.

REMEDIES

- (a) Avoid planting slips from a diseased bed.
- (b) Do not save seed from a field containing diseased tubers.
- (c) Rotate crop; do not plant two years in the same place.

SOFT ROT (*Rhizopus Nigricans*)

Here, this disease seems to be by far the most troublesome of all, and so far as observation goes, is a storage trouble, being strictly confined to the tubers. It attacks the potato wherever there are bruised, broken or cut places, etc., appearing in black powdery masses like the black mold of bread. Immature, cut, broken and bruised potatoes are harbingers and breeders of the disease.

REMEDIES

- (a) Nothing but mature potatoes should be banked. (See cut.)
- (b) Dry them thoroughly before storing.
- (c) Avoid as far as possible the putting in of tubers cut, bruised, or injured in any way.
- (d) Keep cool and as dry as possible; also free from mice, rats or destructive vermin of any kind.

HARVESTING AND STORING

The importance of correctly harvesting the crop is a matter which must not be passed by lightly, as in this lies very largely the success of any method of storing. As far as possible, the following should be observed:

1. Select a time when both the air and ground are dry.
2. Remove the vines with a sharp hoe, vine cutter or any implement that will do the work rapidly and well.
3. Dig before the frost injures the vines to any extent. Dig in the morning and allow the potatoes to lie out all day. Gather up in baskets or boxes holding not more than one bushel each. Handle with great care, as they are easily bruised, and every injury lessens their keeping qualities.

In the matter of storing there is a variety of methods, all possessing more or less merit. Where just a few hundred bushels are to be kept, the old primitive method of banking is quite satisfactory if the potatoes are properly cured and kept dry, which is a very difficult thing to do. For this a well drained piece of land is selected which is slightly hollowed out—the size of the base of the desired bank. This is covered with leaves, pine-tag or straw.

BANKING POTATOES

The potatoes are piled up into a conical shaped mound around a piece of bark curled up, a board flue, or anything that will serve as a ventilator.

The depth to which the straw and earth should be put for this locality, and the cover should vary according to the severity of the climate. When large quantities are kept, potato houses seem preferable, and they can at all times be examined and the defective ones removed.

HOW TO CURE AND STORE THE SWEET POTATO

During the war this station along with many others, set out to find, if possible, how to reduce the enormous storage losses which rendered the growing of sweet potatoes hardly thought of as a money crop.

There seemed to be no method which had an element of certainty about it as far as the farmer was concerned, and for this reason the

Tuskegee station has directed its efforts almost wholly along this line, with the following encouraging results:

- (a) We found that there was little more excuse for the farmers to allow their potatoes to rot than their corn.
- (b) That the fundamental thing in the saving of sweet potatoes is to cure them first.

WHAT IS CURING?

By curing we mean to dry the moisture out of the potatoes to the point where they will give a little when pressed hard between the ball of the thumb and fingers.

HOW DONE

I always manage to dig my potatoes in a very dry time. Spread out thinly in the shade where the air will blow over them freely. They may also be dried out by artificial heat, my method is as follows:

I took an ordinary wire screen door, took off the fine wire and covered it with large coarse wire, I put from two to two and one-half bushels of potatoes on this door which was placed in a window of an ordinary living room. The window was raised so there was a brisk breeze blowing directly over and through the potatoes. If dug in a dry time and the air is dry, three or four days are all that is necessary for medium sized potatoes. I then lay them very carefully in barrels without breaking or bruising any, spread a bit of coarse bagging over the top of the barrel. I have paid no attention to temperature, except to keep them always above the freezing point.

I put up four barrels every year and lose less than three potatoes to the barrel. Last year I lost four potatoes. I have some of the potatoes now, October 14, 1920, just as sound as those I am putting away now.

Note what the Chamber of Commerce, Montgomery, Alabama, says about them:

October 1, 1920

"I received the cured sweet potatoes you sent me, and appreciate very much the thought. I have cooked and compared one with one of this year's crop and readily noted the difference. I am convinced now of their superiority.

"I exhibited to our Board of Directors at their last meeting, and they were very much interested. Each cut a slice and ate it raw. They could hardly believe that the flavor and interior freshness could have been retained.

"On October 4, I had dug nine bushels of Porto Rican potatoes, they were badly cut and bruised as I had them dug by outside labor in the same way the average farmer digs his potatoes, they were re-

moved and placed on a screen in a window, rotting ceased and those slightly affected cured up nicely when the spoiled portion was cut off and the sound part placed in a good draft where the excess of moisture was carried away quickly."

NOTE:—Care must be taken not to cover the barrels or boxes up tightly or the potatoes will sweat and spoil.

AS A FOOD FOR MAN

As a food for human consumption, the sweet potato has been, and always will be, held in very high esteem and its popularity will increase in this direction as we learn more about its many possibilities.

There is an idea prevalent that anybody can cook sweet potatoes. This is a very great mistake, and the many, many dishes of illy cooked potatoes that are placed before me as I travel over the South prompt me to believe that these recipes will be of value (many of which I have copied verbatim from Bulletin No. 129 U. S. Department of Agriculture). The above bulletin so aptly adds the following:

"The delicate flavor of a sweet potato is lost if it is not cooked properly. Steaming develops and preserves the flavor better than boiling and baking better than steaming. A sweet potato cooked quickly is not well cooked. Time is an essential element. Twenty minutes may serve to bake a sweet potato so that a hungry man can eat it, but if the flavor is an object, it should be kept in the oven for an hour."

No. 1, BOILED OR STEAMED

Boil or steam like white potatoes without breaking the skin. If boiled, pour off the water as soon as done, cover the pot with a cloth and let stand on the back part of the range a few minutes before serving.

No. 2, BAKED

Scrub with a brush and rinse with water until thoroughly clean. Bake like white potatoes, without breaking the skin. When done break the skin in one place in the form of a cross, forcing the meat partly out, cap with butter and serve.

Potatoes from 1 to 1 and 1-2 inches in diameter, and from 5 to 6 inches long, are the most desirable for baking—the flavor seems to be far superior to the larger kinds, or the round or irregular sort.

No. 3, BAKED IN ASHES

In this method the sweetness and piquancy of the potato is brought out in a manner hardly obtainable in any other way. Select the same kind of potatoes as described above for baking; cover them with warm ashes to a depth of 4 inches, upon this place live coals and hot cin-

ders; let bake slowly for at least two hours. Remove the ashes with a soft brush and serve while hot with butter.

No. 4, FRIED

Cut in slices lengthwise and fry in deep grease, same as white potatoes. Care must be taken to not allow them to become hard and dry.

No. 5, CHIPS

Cut in thin slices, steam until nearly done, allow the surplus water to drain off or dry between napkins, fry in deep fat to a light brown. This makes a fine breakfast dish. A little salt adds to its flavor.

No. 6, PIE (EXTRA FINE)

Boil in skins. When tender, remove skins; mash and beat until light. To each pint of potatoes, add 1-2 pint of milk, 1-2 pint of cream and four well-beaten eggs; add 1 1-2 teacups of sugar (less if the potatoes are very sweet). Add spice, cinnamon and ginger to taste; one ground clove will improve it. Bake with bottom crust only. The above is enough for five or six pies.

No. 7, SLICED POTATO PIE

Line a deep baking dish with a rich sheet of pastry. Parboil the number of potatoes desired. When two-thirds done remove the skins, slice lengthwise, very thin, cover the dish to a depth of 2 inches, sprinkle with ground all-spice and a dash of ginger, cloves and nutmeg. To a pie sufficient for six people, scatter around the top in small pieces a lump of butter the size of a hen's egg; add one teacupful of sugar and 1-2 teacupful of molasses. Add 1-2 pint of cream, dust a little flour over the top sparingly; cover with hot water, put on upper crust, crimp edges and bake in a moderate oven until done. Serve hot, with or without sauce.

No. 8, GLACE No. 1

Boil and cut in halves medium-sized sweet potatoes, lay evenly in braising pan, baste with syrup and butter warmed together, sprinkle lightly with brown sugar, put in hot oven until brown, and serve in the syrup.

No. 9, GLACE No. 2

Cut in slices 1-2 inch thick, wash and place in deep sauce pan; spread with butter; season with a little grated nutmeg and salt; moisten with broth or water, cover and let simmer over a slow fire for three-fourths of an hour, turning the slices so that they will glaze on both sides. Serve with drawn butter or other sauce.

No. 10, SWEET POTATO COBBLER

Prepare the potatoes the same as for No. 6. Proceed to fill the dish the same as for layer cake, rolling out the layer of dough quite thin

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and spreading the mixture on in layers about 1-4 of an inch thick. Proceed until the dish is full; add to each layer just enough water to cook the layer of crust. Bake until thoroughly done, serve hot with drawn butter or hard sauce.

No. 11, WITH ROAST BEEF, No. 1

Roast the beef and make a brown gravy. Take the sweet potatoes of medium size, previously baked; remove the skin and garnish the dish with the potatoes. Serve the potatoes with the beef.

No. 12, WITH ROAST PORK, No. 1

Parboil the desired number of potatoes with the peelings on until nearly done; remove and peel; lay in the baking dish with the nearly done roast; cook until done, and serve with the pork.

No. 13, WITH ROAST PORK, No. 2

Select a desirable piece of fresh pork; bake until nearly done; dip or pour off as much of the grease as possible; prepare the potatoes the same as for No. 12. Lay them in the gravy and slightly brown with the meat until done.

No. 14, BROILED

Steam, pare and cut in slices 3-8 of an inch thick; lay the slices in a double boiler; salt; cover with melted butter, and broil over a slow fire; serve in folded napkins.

No. 15, STUFFED, No. 1

Bake, then cut off one end and scoop out the inside; season with butter, pepper and salt; beat until light; replace in the skin; close with the piece cut off and put into the oven to heat through. Serve in napkins. Suitable for luncheon.

No. 16, STUFFED, No. 2

Prepare the same as for No. 15, to which add to every pint of potato 1-4 pint of minced ham; mix thoroughly, fill the hulls, heat and serve.

No. 17, A SOUTHERN DISH

Cut cold baked sweet potatoes into slices and put into an earthen dish; add sugar and butter to each layer and bake until slightly brown.

No. 18, CROQUETTES

Take two cupfuls of mashed, boiled, steamed or baked sweet potatoes; add the beaten yolks of two eggs and season to taste; stir over the fire until the mass parts from the sides of the pan. When cold, form into small croquettes, roll in the egg and bread crumbs, and fry in hot lard to amber color. Serve on napkins.

No. 19, SWEET POTATO BALLS

Prepare the same as for croquettes, make into balls and enclose within the center of minced meat.

No. 20, PUREE

Take mashed, boiled, steamed or baked sweet potatoes; season and add enough hot milk to moisten; serve like mashed white potatoes, or put in pudding dish; dress the top with egg and brown in oven; serve with sauce.

No. 21, BROWNED

Cut cold, boiled or stewed sweet potatoes into slices 1-4 of an inch thick; add butter, sugar, pepper and salt and put into hot oven and brown.

No. 22, SCALLOPED POTATOES

Wash and peel the potatoes; slice very thin; put in baking dish in layers; season each layer with salt, butter, 1-2 teacup of sugar, a dash of spice, nutmeg and ginger, cover with milk that has been made 1-2 cream; bake in moderate oven until tender; serve hot.

No. 23, DELICIOUS POTATOES

Wash and pare rather small sized potatoes; steam or boil until they can be readily pierced with a fork; dry the surplus water off; have a little butter melted in a dish, roll the potatoes in this; place in a quick oven and brown slightly; serve hot.

No. 24, HASHED POTATOES

Take the cold sweet potatoes, either steamed or boiled, roasted or baked; cut into small pieces, place in a well buttered pan, mince scraps of meat of any kind and stir into it; let brown and serve hot. Chicken makes a most excellent meat to put into it.

No. 25, BAKED WITH APPLES

(delicious)

Take four medium sized potatoes and the same number of apples. Wash, peel and cut the potatoes in slices about 1-4 of an inch thick; pare and slice the apples in the same way; put in baking dish in alternate layers; sprinkle 1 1-2 cups of sugar over the top, scatter 1-2 cup of butter also over the top; add 3-4 pint of hot water; bake slowly for one hour; serve steaming hot.

No. 26, SWEET POTATO MUFFINS

Boil until thoroughly done a sweet potato weighing about 3-4 of a pound; mash very fine; pass through colander to free it from lumps; add to it a large tablespoonful of butter and a little salt; whip well, now add 1-2 cupful of milk and two well-beaten eggs and flour enough to make a soft batter, which will be about two cup-

fuls. Before adding the flour sift into it one teaspoon of baking powder. Bake in muffin rings or gem pans.

No. 27, SWEET POTATO DOUGHNUTS, No. 1

2 eggs	1 cup cooked and mashed
1 cup sugar	sweet potatoes
3 tablespoons melted butter	1-2 teaspoon soda
1 cup sour milk	1 saltspoon salt
3 cups flour	1 saltspoon cinnamon

Beat the eggs until light, add the sugar, butter and milk. Mix the salt, soda and spice with the flour. Stir into the egg mixture, beat in thoroughly the mashed sweet potatoes; if too soft add just enough more flour to make it just soft enough to roll out.

Roll, cut out, and fry in deep fat hot enough for the dough to rise at once.

No. 28, SWEET POTATO DOUGHNUTS, No. 2

Make exactly the same as for No. 1 except take two cups of flour and two cups of mashed sweet potatoes.

No. 29, SWEET POTATO PUFFERS

Whip two eggs until quite light; two cups of cold mashed potatoes; one cup of flour into which one teaspoon of baking powder has been sifted. The potatoes and eggs should be worked together, then the flour and baking powder; roll lightly; cut quickly and fry into deep fat like doughnuts. Some think a little spice improves the flavor.

No. 30, SWEET POTATO SAVORIES

Boil and mash as many sweet potatoes as required; when cold stir in sufficient flour to form into a paste; roll out and cut into small squares, soak a few bread crumbs in water for 5 or 10 minutes; squeeze dry; add a little chopped parsley, mixed herbs, and a small onion previously soaked in hot water; season with salt and a dash of pepper. Mix all together thoroughly, put a little on each square of paste, and fold over as in sausage rolls; fry in boiling fat until brown; drain and serve.

No. 31, SWEET POTATO NUTS

Take one pint of boiled and mashed potatoes, one pint of toasted bread crumbs rolled fine, one pint of mixed nut meats chopped fine (peanuts are excellent); season with salt, a little pepper, also sage and mace if desired; take the yolks of two eggs; stir in two teaspoons of baking powder; whip until light; pour it into the above mixture and stir well; form into small cakes; dip each into the whites of the eggs, then into shredded cocoanut and brown in a frying pan containing a little pork fat (not deep fat); turn; brown on both sides.

No. 32, SWEET POTATO RICED

Pare and boil the potatoes in water slightly salted; when done drain off the water, and run through a ricer; serve hot with plain or drawn butter.

The dry, mealy varieties are especially pleasing when prepared in this way.

CANNING

The sweet potato is quite easy to can, and in several states the industry has assumed quite handsome proportions. They find a ready sale in localities where fresh ones cannot be had.

HOME CANNING OF SWEET POTATOES IN GLASS JARS

Peel and cut the potatoes in small cubes or thick slices; pack them just as closely and firmly as possible in the jars; fill with cold water, put the lid on loosely, and boil 60 minutes; tighten the lids at once. Potatoes prepared in this way are exceedingly fine.

COMMERCIAL CANNING

Mr. H. B. Benson, head of our Canning Division and who successfully cans every year several thousand cans of potatoes, hands us the following as his method:

"The canning of sweet potatoes is not very difficult, but it requires considerable attention and care, because if not handled properly an unsightly article will appear.

"There are two styles of packing, one being the whole potatoes, packed as dry as possible, the other being pie stock, in which the potatoes appear as a pulp. In packing the whole potatoes it is very necessary to keep them dry, because the nature of this vegetable is to absorb water, and they should not come from the cans in a water-soaked condition. To avoid this, steam them about three-fourths done, slip the skins off, and pack into the cans as tightly as possible without mashing; exhaust 15 or 20 minutes; seal and cook 3-pound cans 45 minutes at 240 degrees Fahrenheit, or 90 minutes at 212 degrees Fahrenheit."

AS A FOOD FOR STOCK

The value of root crops for stock has so long been recognized that it is almost universally regarded as a necessity, not alone for the actual food nutrients they contain, but the peculiar diatetic effect so essential to the well-being of all animals.

A glance at the table below will convince the most skeptical of its superiority over many of the standard food-stuffs.

AVERAGE COMPOSITION

Food Material	Protein or Muscle	Carbohydrates or Fat
	Builders	Formers
Mangel Beet	1.4 per cent	26.4 per cent
Turnip	1.1 per cent	11.4 per cent
Rutabaga	1.2 per cent	9.3 per cent
Carrot	1.1 per cent	9.0 per cent
Parsnip	1.6 per cent	7.6 per cent
Sweet Potato	1.5 per cent	7.6 per cent

We readily see that the potato contains practically as much muscle-building material as any, and more than double that of the fat formers.

In view of the above table and most especially the fact that years of experience have taught us that the sweet potato crop is the one crop that can be depended upon in favorable years for an enormous yield, which can be greatly increased with a little intelligent direction in the preparation of the soil, fertilization, etc., we have been able to produce here on our Experiment Station 359 bushels to the acre, and I fully believe our soils can be made to yield 500 bushels of the coarser growing varieties.

A series of experiments have proven that the Dooley Yam, Southern Queen, Pumpkin Yam and the White and Red Nansemond may be left out in the field with but slight injury for feeding purposes, which would save the expense of housing or banking.

EXPERIMENT No. 1

Mr. M. V. Darthard, in charge of the horses and mules, who personally conducted the following experiments, is enthusiastic over the results. The experiment covered a period of 30 days:

Four mules were fed potatoes, two that were doing heavy work and two that were doing light work; corn was the grain ration. After the preliminary feeding, substitutions for grain were made at the rate of 2 3-4 to 2 1-2 pounds of potatoes to 1 1-2 pounds of corn plus the usual ration of hay.

These four mules kept in good condition, and were able to do good work. In fact they looked as well and were able to do as much work as the four check mules.

The result of this experiment was, that the sweet potato was made to replace 1-2 of the corn for the feeding of mules, which means a great saving in actual dollars and cents.

CAUTION

It is highly important that the potatoes be gradually fed in the beginning, increasing the quantity as the animal becomes accustomed to them. Frozen potatoes must also be fed with caution, or ascetic

or alcoholic fermentation may set in and cause serious results. Do not feed the potatoes to horses, mules and cattle after they have become sour; hogs may eat them with safety.

EXPERIMENT No. 2

THE FEEDING OF SWEET POTATOES TO HOGS

This experiment was conducted by Mr. R. R. Robinson, in charge of the swine herd.

Six hogs were used; two were fed wholly on sweet potatoes, two were fed shorts, and two were fed corn. Eight pounds of potatoes were fed each day, with the following gain of flesh at the close of 28 days:

Lot No. 1. Fed on potatoes; made a total gain of 24 1-2 pounds

Lot No. 2. Fed on shorts; made a total gain of 33 pounds

Lot No. 3. Fed on corn; made a total gain of 53 1-2 pounds

These figures are intensely interesting from the fact that such highly concentrated foodstuffs as shorts and corn only exceed the potatoes thus: In the matter of putting on fat—corn, 29 pounds; shorts, 8 1-2 pounds. It is also easy to see that these results are not inconsistent with good farm practice, and all farmers with experience know that all kinds of stock, such as hogs, cattle, horses, mules and poultry, are not only fond of them, but thrive upon them as well, when the potatoes are judiciously fed with concentrates, such as corn, cottonseed meal, bran, shorts, etc.

VINES

The vines make an excellent quality of hay, which chemists find to be in composition about the same as that of succulent cow-pea vines. The vines turn black when dried, but the stock eat them greedily. The vines have been found to be of the following composition: muscle builders, 12.48 per cent; fat formers, 78.79 per cent.

MISCELLANEOUS INFORMATION

When the potatoes are frozen so that they become soft they must be fed as fast as possible, as they will not keep.

Care must be taken not to give horses, mules and cattle too much of them, as they are very sweet after freezing, and tempting to the appetite. Steaming, boiling and mixing with grains, shorts, meal, bran, corn, etc., make an excellent fattening food for hogs and one greatly relished. We feed them after being frozen the same as before without any apparent bad results.

HOW TO MAKE SWEET POTATO FLOUR

There are several grades of this product and quite as many ways to manufacture them. Each one of these flours or meals (as most millers insist upon calling them) has a particular character of its

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own and is therefore adapted to certain uses the other products are not.

These sweet potato flours are generally speaking of three kinds.

1st. Those made from the uncooked potato.

2nd Those made from the cooked potato.

3rd Those made from a careful system of roasting, or from the starch making process. The first two will interest the housewife most so, therefore, I will dwell almost or quite exclusively on these.

FLOUR NO. 1. FROM THE RAW POTATO

Here, all that is necessary is to wash, peel and slice the potatoes real thin, dry in the sun, oven or dryer until the pieces are quite brittle, grind very fine in a clean coffee mill, spice mill, or any type of mill that will make wheat flour or corn meal; bolt through fine cloth in the same way as for other flours.

The fine flour-like particles will pass through and the coarse granular meal left on the bolting cloths.

Uses

This kind of flour is fine for making mock rye bread, ginger snaps, wafers, waffles, batter cakes, custards, pies, etc. Bread can be made with it, but it makes a dough deficient in elasticity, bread dark in color and a loaf which dries out quickly.

The coarser meals can be cooked in a great variety of ways and make very palatable dishes; they are to be soaked in warm liquid (whatever is desired to cook them in), when soft proceed as for grated potatoes.

FLOUR NO. 2 FROM COOKED POTATOES

For the making of this flour the potatoes are boiled, or steamed (preferably the latter) until done, sliced or granulated by mashing or running through a food chopper and dried until they become very brittle, they are made into flour and meal exactly the same as given for Flour No. 1.

Uses

This kind of flour is especially fine for bread, cakes, pies, puddings, sauce, gravies, custards, etc.

Indeed, most people consider a loaf made in the proportion of one-third sweet potato flour to two-thirds wheat flour, superior in flavor and appearance to all wheat flour.

Many experiments have proven that either the mashed sweet potato or the sweet potato flour may be used in bread up to as high as 50%, but at this point it becomes decidedly potato-like in texture and flavor but not unpalatable or unwholesome.

FLOUR NO. 3. FROM PULP

The sugar and starch has been greatly reduced. This flour is made from the pulp after the starch has been removed, it is dried without cooking, ground and bolted exactly the same as recommended for the other flours.

When made into puddings, pies, blanc-mange, etc., the same as shredded cocoanut, it resembles it very much in taste and texture and is very palatable, and is a most welcome addition to the dietary.

It can also be used in the making of bread and is especially valuable where people object to a loaf with the least bit of a sweet taste, also where they wish one with as little starch and sugar as possible.

SWEET POTATO STARCH HOUSEHOLD METHOD

This is very easily made, all that is necessary is to grate the potato, the finer the better, put into a cheese cloth or thin muslin bag and dip up and down, in a vessel of water, squeezing occasionally, continue washing as long as the washings are very milky.

Allow it to settle five or six hours or until the water becomes clear, pour off; rewash the starch, which will be in the bottom of the vessel, stir up well, allow to settle again, pour off the water and let dry, keep the same as any ordinary starch.

Uses

Use exactly the same as corn starch in cooking; I am confident you will find it superior to corn starch; it makes a very fine quality of library paste, and has very powerful adhesive qualities.

In certain arts and trades it is almost indispensable.

SWEET POTATO SUGAR

By saving the water which the pulp was washed in first, in the starch making process and boiling down, the same as for any syrup, a very palatable, noncrystalline sugar will be the result; this sugar or syrup can be used in many ways.

Here in the South and other sections of the country where fresh sweet potatoes can be had almost or quite the year round, the flour is not a necessity for bread-making; but for commercial purposes there are almost unlimited possibilities, and is destined to become more popular as fast as the public finds out what a delicious, appetizing and wholesome product these flours are.

Our method of using follows with the hope that thousands of housewives will try out this most satisfactory way to add something new, wholesome, attractive and economical to the menu.

HOUSEHOLD RECIPES
SWEET POTATO BREAD

Take:

- 1 cup finely mashed sweet potatoes;
- 2 tablespoons warm water;
- $\frac{1}{2}$ yeast cake;
- 1 teaspoon salt;
- Two and $\frac{3}{4}$ cups flour, or sufficient to make a soft dough.

Add the salt to the potatoes, and the yeast; pour in the water; add flour enough to make a smooth sponge (about a cupful); cover and set in a warm place to rise.

When light add the remainder of the flour or whatever is needed to make a smooth elastic dough. Cover and let rise until light; mould; shape into loaves or rolls; let rise and bake.

Many variations of the above bread can be made by adding sugar, butter, lard, nuts, spices, etc.

SWEET POTATO BISCUITS

Take:

- $\frac{1}{2}$ cupful mashed sweet potatoes;
- 1 cupful flour;
- 4 teaspoons baking powder;
- $\frac{1}{2}$ teaspoon salt;
- 2 tablespoons butter or lard.

Milk sufficient to make a soft dough. Sift the flour, salt and baking powder together several times; add these to the potatoes, mixing in with a knife.

Now work the fat into the mixture lightly; add the milk; work quickly and lightly until a soft dough is formed; turn out on a floured board; pat and roll out lightly until about one-half inch thick; cut into biscuits; place on buttered or greased pans, and bake twelve or fifteen minutes in a quick oven.

SWEET POTATO BISCUITS NO. 2 (EXTRA FINE)

Take:

- 1 cup boiled and finely mashed sweet potatoes;
- 2 eggs, well beaten;
- 2 cups flour;
- 2 teaspoons baking powder;
- 1 teaspoon salt;
- 2 scant tablespoons melted butter or lard;
- 1 tablespoon sugar (if desired);
- 2 cups milk.

Mix together all the dry ingredients and stir into the milk, beaten eggs and potato.

If too soft, add more flour, sufficient to make a soft dough. Roll out lightly; cut with a biscuit cutter; bake in a quick oven.

SWEET POTATO BREAD (BAKER'S METHOD)

This recipe was given me by Mr. J. M. Colter, who had charge of the Institute's Bakery.

Take:

- 70 pounds of wheat flour;
- 30 pounds of finely mashed sweet potatoes;
- 40 pounds of water;
- 1½ pounds of salt;
- 1 pound of sugar;
- 1 pound of lard;
- 1 pound of compressed yeast.

Every other operation is exactly the same as for bread or rolls made from all wheat flour.

Mr. W. T. Shehee, former Steward of the Boarding Department, says it not only gives universal satisfaction, but is preferred by many to bread or rolls made from all wheat flour.

I have very briefly and imperfectly touched upon the many possibilities of the sweet potato. I trust that Macon County will take the lead in developing the almost limitless possibilities of this splendid crop and show its relation to the dairy industry, beef production, starch mills and that it is the most important and useful of all our root crops for the feeding of farm animals.

